

GitHub Actions

automate workflows

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Agenda:

- Overview
- Core Concepts
- Live Demo
- Q&A

Workflow:

workflow = $\underbrace{\text{event}}_{\text{if an event triggered on something}} \longrightarrow \underbrace{\text{JobA + JobB + JobC}}_{\text{then do these works}}$

event = github webhook event (or) scheduler event (or) external event

job = host & action A + action B + action C
jobs executes in parallel unless otherwise specified

host = GitHub Hosted Servers or

action = unit of work to be done ... in two ways
use ready-made actions from marketplace
run a project command or OS command

Events:

Webhook Events:

push, pull_request, pull_request_comment

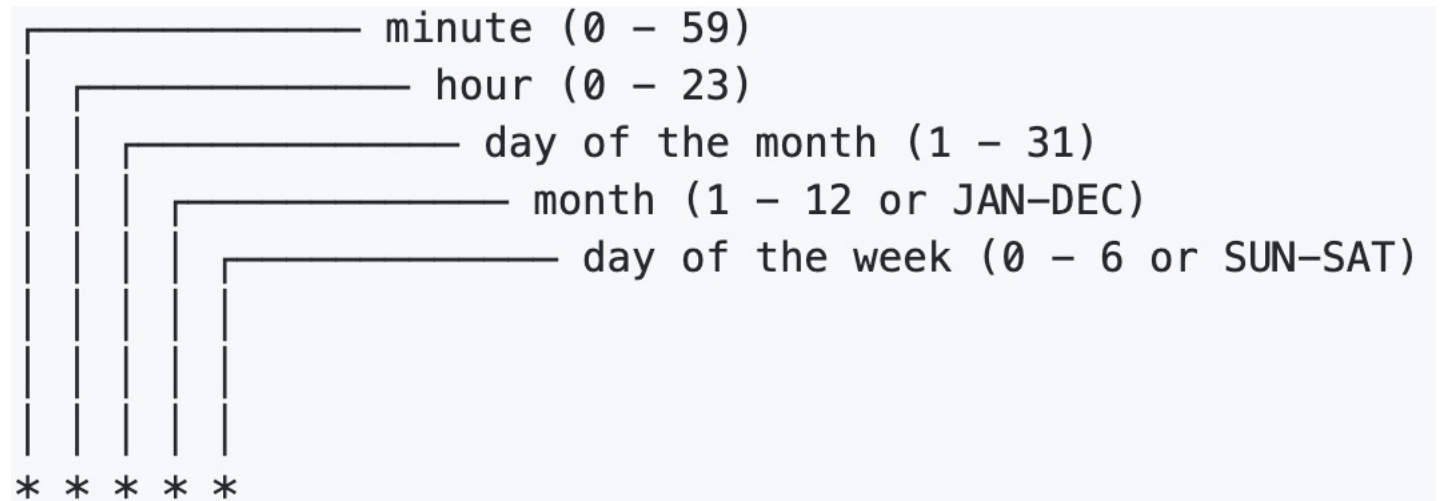
<https://docs.github.com/en/actions/learn-github-actions/events-that-trigger-workflows#webhook-events>

Scheduled Events:

on:

schedule:

- cron: '30 5,17 * * *'



External Events(Manual):

repository_dispatch: types: [opened, deleted]

workflow_dispatch

Events:

on:

push:

branches:

- master

tags:

- v1

paths:

- 'test/*'

← push event

← Only for the master branch

← Only commits pushed to the v1 tag

← Only files that are in the test directory

Events:

Webhook Event Payload	Activity Types
pull_request	<ul style="list-style-type: none">- assigned- unassigned- review_requested- review_request_removed- labeled- unlabeled- Opened- edited- closed- ready_for_review- locked- unlocked- reopened

on:

pull_request:

types:[opened, review_requested]

GitHub-Hosted Runners

Virtual environment	YAML workflow label	
Windows Server 2022 ^[beta]	windows-2022	The windows-latest label currently uses the Windows Server 2019 runner image.
Windows Server 2019	windows-latest (or) windows-2019	
Windows Server 2016	windows-2016	
Ubuntu 20.04	ubuntu-latest (or) ubuntu-20.04	
Ubuntu 18.04	ubuntu-18.04	
macOS Big Sur 11	macos-11	
macOS Catalina 10.15	macos-latest (or) macos-10.15	The macos-latest label currently uses the macOS 10.15 runner image.

Self-Hosted Runners

The following operating systems are supported for the self-hosted runner application.

Linux

- Red Hat Enterprise Linux 7 or later
- CentOS 7 or later
- Oracle Linux 7
- Fedora 29 or later
- Debian 9 or later
- Ubuntu 16.04 or later
- Linux Mint 18 or later
- openSUSE 15 or later
- SUSE Enterprise Linux (SLES) 12 SP2 or later

Architecture

- x64 - Linux, macOS, Windows.
- ARM64 - Linux only.
- ARM32 - Linux only.

Windows

- Windows 7 64-bit
- Windows 8.1 64-bit
- Windows 10 64-bit
- Windows Server 2012 R2 64-bit
- Windows Server 2016 64-bit
- Windows Server 2019 64-bit

macOS

- macOS 10.13 (High Sierra) or later

```
runs-on: [self-hosted, linux, ARM32]
```

- **self-hosted** - Run this job on a self-hosted runner
- **linux** - Only use a Linux-based runner
- **ARM32** - Only use a runner based on ARM64 hardware



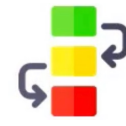
Events

- Specific activates that trigger workflow run
- on:
- Provide,
 - a single event
 - an array of events
 - activity types



Actions

- Actions are your reusable unit of code
- Action can be from marketplace or your own
- Action must include it as a step



Jobs

- A Job consists of one or more steps
- Job can run independently or sequentially
- A Step is a set of tasks that an be executed by a job



CI / CD

- Create custom CI workflows that automate building and testing of our code
- Create custom CD workflows to automatically deploy our code to any cloud , self-hosted service



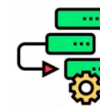
Runner

- This tells our workflow run where the virtual environment will be
- Wait for an available job to be kicked off when an event is triggered
- Only run one job at a time



Workflow File

- an automated process that is made up of one or multiple jobs and can be
- triggered by an event
- Defined using YAML file in `.github/workflows` directory



Workflow Run

- instance of your workflow that runs when the pre-configured event occurs
- You can see the jobs, actions, logs & statuses for for each workflow run



Artifacts

- Artifacts are the files created when you build and test your code
- Binary, package or log files

Useful links:

- GitHub Runner : <https://github.com/actions/runner/releases/tag/v2.283.3>
- GitHub Actions Hero : <https://github-actions-hero.vercel.app/>
- GitHub learnings Lab : <https://lab.github.com/>
- GitHub Marketplace : <https://github.com/marketplace?type=actions>